Threats to Soils and Geology in the NCR

Science Advisory Committee Meeting at Thorpewood.

Geologic Resources Workgroup

Notes from 3-7-02

Participants: Christina Wright (Facilitator), Bob Higgins, Pat Toops.

Resource Component	***Stressor***	***Sources***	***Ecological Effects***	***Severity of Threat*** *(High – Medium – Low - Unknown)*	***Measures/Vital Signs***
Soil	Erosion	Development, land clearing	Increased siltation, reduced productivity/health/abundance of soil, plants, and aquatic organisms	High	Total suspended solids, sediment loading, light penetration, increased sedimentation and changes in sedimentation patterns, land use change, stream geomorphology
Soil	Pesticide Loading	Agricultural and residential use	Reduced water quality, fishery health, and aquatic invertebrate communities and populations	High	Test for suite of pesticides commonly used in local area.
Soil	Nutrient Loading	Agricultural and residential use	Reduced water quality, fishery health, and aquatic invertebrate communities and populations. Algal blooms, eutrophication	High	Soil water and stream levels of N and P. High algal growth, low light penetration
Soil	Impervious Surfaces	Paving, walls, armored banks	Scouring, cutting/changing shoreline, flooding,	High	Increased velocity of storm water flow, land use change
Soil	Compaction	Visitor Use	Changes in vegetation survival,	Urban - high	Monitor soil compaction,

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			changes in soil physical properties		Bulk density or other soil compaction measures.
Soil	Temperature Change	Surface land exposure, development	Changes in soil micro-climate	Unknown/high	Soil Temperature monitoring, changes in mycorrhiza suite
Soil	Change in pH, loss of buffering capacity	Acid rain, atmospheric deposition	Change in vegetation types, mycorrhiza and other soil flora, fauna	Unknown	Soil pH, acid neutralizing capacity.
Soil	Change in vegetation/exotics	Development, nursery use of exotics	Change in soil organic matter composition, changes in soil flora and fauna	Unknown	
Groundwater	Consumption of groundwater in excess of replinishment	Human, agricultural, residential and domestic animal use	Reduced groundwater quantity, and quality. Loss of springs and seeps, wetland loss, changed of soil saturation zones.	High	Survey of groundwater table and groundwater chemistry.
Surface Water	Impervious surfaces	Infrastructure, development, residential and agricultural use	Increased storm water flow, increased erosion, changes in stream morphology, increased exposure to nutrients/pesticides, change in hydrologic cycle effecting floodplains, and floodplain/riparian buffer capacity	High	Stream storm water flow, flood frequency, sedimentation load, stream morphology. Photo points.
Hazards	Cutting the toe of slopes	Development, roads, structures, trails	Reduced slope stability	Low	Slope failure, movement of materials downslope, erosion, gully formation
Surficial Factors	Erosion	Development	Change in “normal” sedimentation sequence and composition	Unknown/low	Coring of soil/sediment sequence
Surficial Factors	Clearing of land	Development, agriculture, zoning laws (local and county governments)	Loss of soil surface cover, increased soil surface and groundwater temperatures	High	Measurement of soil surface and groundwater temperature.